OCT 2022

Added value from logging residues

In May 2021 when we started this project, we knew that logging residues were rich in green chemicals, but we did not know how to separate the needle-rich fraction and how to extract the high-value chemicals. In September 2022 the project goals have been achieved. We have developed a model where to find and how much of these chemicals are available in the forest in the BA region. Interviews with forest companies have shown that procurement of fresh logging residues is possible with alternative value chains. An innovative technology has proven that it is possible to separate fractions rich in green needles and that substantial amounts of high-value chemicals can be extracted. Two companies have confirmed that it is possible to use these chemicals for industrial applications. An unexpected result was that, after the separation of needles, it was possible to use the remaining fraction as growing media.

TO REPLACE FOSSIL-BASED CHEMICALS

The project's overall goal has been to contribute to the EU's goal to become climate-neutral by 2050 and to support Finland's and Sweden's political goals for bioeconomic growth by demonstrating solutions for substituting chemicals based on fossil resources for biobased resources. The refining processes developed in the project are environmentally friendly methods. The project increases material efficiency by developing cascade utilization of logging residues. Fractions not used for chemical extraction can be used for growing media, biorefining or combustion. The project has built a bridge between researchers from forestry and chemistry and between research and industry that continuously will contribute to sustainable business development.

BUSINESS COOPERATION

The involvement of the business partners has contributed to the project's results. A manufacturer of beauty products, Lumene, has tested the extract to their emulsion after it had been optimized and modified by Luke and Centria. A Tannery, Kokkolan Nahka, has after testing found it promising to treat the leather with tannin extract from logging residues. Eight forest entrepreneurs from both countries have contributed to an operating scheme for the procurement of fresh logging residues. Two Swedish Forest Industries, Holmen and Sveaskog, delivered stand parameters and terrain conditions for typical spruce-dominated stands in the Botnia-Atlantica area and based on that data the multi-criteria selection support model was developed. To attract possible investors' interest, project results have been continuously shared with Kling Mill technology owner, RISE Processum and Metsä Board paper mill.

5 NEW MODELS AND ANALYSIS METHODS

The project has developed 5 new models and analysis methods

1. Bioactive compounds can be extracted from needle-rich biomass; antioxidativity, extract for tanning, growing media and biocomposites.
2. New green chemicals: optimized and tested methods for extracting and characterisation of total phenolics from logging residues.
3. New methods for handling, fractionation, and separation of green logging residues.
4. A regional operating scheme for procurement of green logging residues.
5. New maps based on the multi-criteria selection support model with the amount of high-value chemicals in the BA forests on the Swedish and the Finnish side of the Botnia-Atlantica region.

CROSS-BORDER COOPERATION

The project has been characterized by cross-border cooperation on all levels. Cross-border work has created a new value chain from logging residue separation in SLU to extraction experiments in Luke and to further analysis in Centria. All partners have participated and contributed with input to the progress of work packages. The work with gender equality and non-discrimination has focused on striving for an open and inclusive process that includes equal opportunities for everyone regardless of gender. The aim was to increase the quality of the internal communication and with that the quality of the project.

Interreg Botnia-Atlantica · Österbottens förbund Pohjanmaan liitto · region västerbotten · Luke · SLU · Centria · Metsäkeskus Forest Centre · BioFuel Region